REMARKS

This Amendment and Response to Non-Final Office Action is being submitted in response to the non-final Office Action mailed June 4, 2007. Claims 15-31 are pending in the Application.

Claims 15-31 are rejected under 35 U.S.C. §103(a) as being unpatentable over Ye *et al.* (U.S. Pat. No. 6,417,965) in view of Kinoshita *et al.* (U.S Pat. Pub. No. 20020001124) and further in view of Zahnley *et al.*(U.S. Pat. Pub. No. 20020176156).

In response to this rejection, Claim 15 has been amended to further clarify the subject matter which Applicants regard as the invention, without prejudice or disclaimer to continued examination on the merits. This amendment is fully supported in the Specification, Drawings, and Claims of the Application and no new matter has been added. Based upon the amendment and the arguments presented herein, reconsideration of the Application is respectfully requested.

Claims 15-31 - §103(a) Rejection - Ye *et al.*, Kinoshita *et al.*, and Zahnley *et al.*

Claims 15-31 are rejected under 35 U.S.C. §103(a) as being unpatentable over Ye *et al.* (U.S. Pat. No. 6,417,965) in view of Kinoshita *et al.* (U.S Pat. Pub. No. 20020001124) and further in view of Zahnley *et al.*(U.S. Pat. Pub. No. 20020176156).

With regard to Claim 15, Examiner states Ye *et al.* teach a controlling device for operating the optical amplifier in either a gain threshold mode or a constant gain mode, and the controlling device is further configured for switching the optical amplifier from the gain threshold mode to the constant gain mode when an absolute value of a gain error exceeds a threshold.[1] This is not possible since Ye *et al.* only measure input power, and therefore do not calculate gain error in the manner taught by Applicants, i.e., wherein the gain error is a difference between a target gain and a gain of the optical amplifying

[1] U.S. Pat. No. 6,417,965

device, ***wherein the gain comprises the difference between input and output power measured by a measuring device***. Applicants have amended independent Claim 15 to clarify this limitation related to how gain error is determined.

Applicants also respectfully submit that the combination of Ye *et al.*, Kinoshita *et al.*, and Zahnley *et al.* do not teach or suggest an optical amplifying device operating in two modes, i.e., a gain threshold mode or a constant gain mode responsive to input power variations. All of these references operate in only one mode. Applicants' present invention is a control loop between these two modes responsive to input power variations based on measured input and output power.

Examiner cites Paragraph [0049] of Zahnley *et al.* for the proposition of switching gain from constant to threshold mode for a predetermined amount of time if a transient has been detected. Applicants assert that this text does not teach or suggest said controlling device further configured for switching the optical amplifying device back and forth between the gain threshold mode and the constant gain mode ***utilizing a control loop on measured input and output powers***, and said controlling device further configured for switching the optical amplifying device from the constant gain mode to the gain threshold mode when no transient events occur during a lockout period.

Zahnley *et al.* specifically teach "[t]o avoid these spikes, the control loop which includes first loop controller 234, second loop controller 235, and mixer 236 checks the input signal 201 at each sampling interval (e.g. at time (k-1), k, (k+1), etc.) to determine if it has reached the threshold for gain-switching. If the threshold has been reached, the controller will "skip" a certain number of samples." Applicants respectfully submit that Zahnley *et al.*, like Ye *et al.*, do not teach or suggest a control loop on the measured input and output powers to determine the optical amplifier operating mode.

Specifically, Applicants have amended Claim 15 to recite:

15. An optical amplifying apparatus, comprising:

an optical amplifying device ***operating in one of a gain threshold mode and a constant gain mode, wherein the gain threshold mode is configured to deliver one of constant output power and constant pump power to suppress relatively small in magnitude input power variations, and wherein the constant gain mode is configured to track input power due to relatively large in magnitude input power variations***;

a controlling device configured for operating said optical amplifying device in one of ***the*** gain threshold mode and ***the*** constant gain mode ***responsive to input power to the optical amplifying device***, said controlling device further configured for switching the optical amplifying device from operating in the gain threshold mode to operating in the constant gain mode when an absolute value of a gain error exceeds a gain threshold, wherein the gain error is a difference between a target gain and a gain of the optical amplifying device, ***wherein the gain comprises the difference between input and output power measured by a measuring device***, said controlling device further configured for switching the optical amplifying device back and forth between the gain threshold mode and the constant gain mode ***utilizing a control loop***, and said controlling device further configured for switching the optical amplifying device from the constant gain mode to the gain threshold mode when no transient events occur during a lockout period; and

said measuring device configured to measure power levels on a plurality of points within said optical amplifying device including at least an input power (P_{IN}) and an output power (P_{OUT}) of the optical amplifying device, said measuring device also configured to communicate with said controlling device ***to provide said input power and output power for the control loop***.

Applicants teach and claim an optical amplifying device that switches from one mode to another, as appropriate, through the use of a gain threshold **compared to a gain error based on input and output power**. Thus, the optical amplifying device not only switches from a gain threshold mode to a constant gain mode, as necessary based upon assessed conditions, but also switches from the constant gain mode back to the gain threshold mode.

Claims 16-31 are dependent claims either directly or ultimately dependent from Claim 15. Based on the same unique and novel features of the present invention as described above, namely that Claim 15 has unique and novel features; it is respectfully asserted that these dependent claims are now in condition for allowance.

Therefore, Applicants submit that the rejection of Claims 15-31 under 35 U.S.C. §103(a) as being unpatentable over Ye *et al.* in view of Kinoshita *et al.* and further in view of Zahnley *et al.* has now been overcome and respectfully request that this rejection be withdrawn.

CONCLUSION

Applicants would like to thank Examiner for the attention and consideration accorded the Application. Should Examiner determine that any further action is necessary to place the Application in condition for allowance, Examiner is encouraged to contact undersigned Counsel at the telephone number, facsimile number, address, or email address provided below. It is not believed that any fees for additional claims, extensions of time, or the like are required beyond those that may otherwise be indicated in the documents accompanying this paper. However, if such additional fees are required, Examiner is encouraged to notify undersigned Counsel at Examiner's earliest convenience.

Respectfully submitted,

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